

## A NEW BLACK FLY OF *SIMULIUM* (*MONTISIMULIUM*) FROM SICHUAN PROVINCE, CHINA (DIPTERA, SIMULIIDAE)

ZHANG Chun Lin, CHEN Harr Bin

Guangxi Medical College, Guiyang 550004, China

**Abstract** A new species, *Simulium (Montisimulum) jiajinshanense* sp. nov., is described on basis of specimens collected from Jiajinshan, Sichuan Province, China. This new species can be readily separated from several known related species by several combination characters including the shape of cibarium in the female, the structure of female and male genitalia, the simple cocoon and the filaments branching in the pupa, and the several characters of larva.

**Key words** Diptera, Simuliidae, *Simulium (Montisimulum)*, new species, Sichuan Province.

Previous paper (Chen, Huang and Zhang, 2005) reported two new species belonging to the subgenus *Montisimulum* from Sichuan Province, China. This paper describes another new species, *Simulium (Montisimulum) jiajinshanense* sp. nov. from same distribution area. The type specimens are deposited in the Department of Biology, Guiyang Medical College.

*Simulium (Montisimulum) jiajinshanense* sp. nov. (Figs. 1-16)

Female. Body length about 3.5 mm. Wing length about 3.0 mm.

Head. Nearly as wide as thorax. Frons shiny, sparsely covered with golden recumbent hairs and dark erect hairs; frontal ratio 8.2: 6.2: 6.0; frons head ratio 8.2: 33.2. Clypeus with a few golden hairs as well as dark hairs. Antenna composed of 2+9 segments, brownish black except first two segments yellowish brown. Maxillary palp greyish brown, with 5 segments in proportion of 2.2: 2.0: 7.5: 5.6: 13.0; 3rd segment much enlarged, with elongated sensory vesicle, which is about 2.5 times as long as wide and 0.6 of the length of respective segment. Maxilla with 6 inner teeth and 6 outer ones. Mandible with 22 inner teeth and lacking outer ones. Cibarium unarmed but with a prominent median projection on posterior border.

Thorax. Scutum black, covered densely with golden pubescence as well as sparse erect black hairs on prescutellar area. Scutellum greyish, with sparse golden pubescence and a few black erect hairs. Postscutellum dark and bare. Pleural membrane and katepisternum bare. Legs. All coxae and trochanters brown except fore trochanter pale; all femora pale

with distal 1/3 brown, and covered with golden hairs; all tibiae brown except median large portions of outer surface which are pale, and covered golden hairs; all tarsi brown except basal 1/4 of hind basitarsus and basal 1/2 of second tarsomere pale. Fore basitarsus nearly parallel side, W:L= 1.0: 8.0, calcipala much enlarged, pedisulcus deep. Each claw with a strong basal tooth. Wing. Costa with spines as well as hairs. Subcosta hairy. Basal section of R haired, hair tuft of stem vein blackish brown.

Abdomen. Basal scale pale brown with a fringe of yellow hairs. Terga dark brown except 2nd tergum pale brown. Terga 6-8 shiny. Genitalia. Sternite 8 with a lot of black hairs on each side. Anterior gonapophyses triangular in shape, covered with several microsetae, inner margins widely separated. Genital fork with slender sclerotized stem; arm moderately wide, each with a strong projection directed forwards. Spermatheca ellipsoidal, sclerotized with reticulate pattern. Paraproct and cercus of moderate size.

Male. Body length about 4.0 mm. Wing length about 3.0 mm.

Head. Wider than thorax. Upper eye consisting of about 17 vertical and 16 horizontal rows of large facets. Clypeus dark grey with a few black hairs. Antenna composed of 2+9 segments, which are brown except scape and pedicel brownish yellow; 1st flagellomere about 2.0 times as long as next one.

Maxillary palp with 5 segments, sensory vesicle small, almost rounded, about 0.2 times as long as 3rd segment.

Thorax. Scutum black, covered with golden pubescence and some black erect hairs. Scutellum dark

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grey, with a few golden pubescence and some black erect hairs. Postscutellum black, shiny and bare. Pleural membrane and katepisternum bare. Legs. Nearly as in female except subcosta bare.

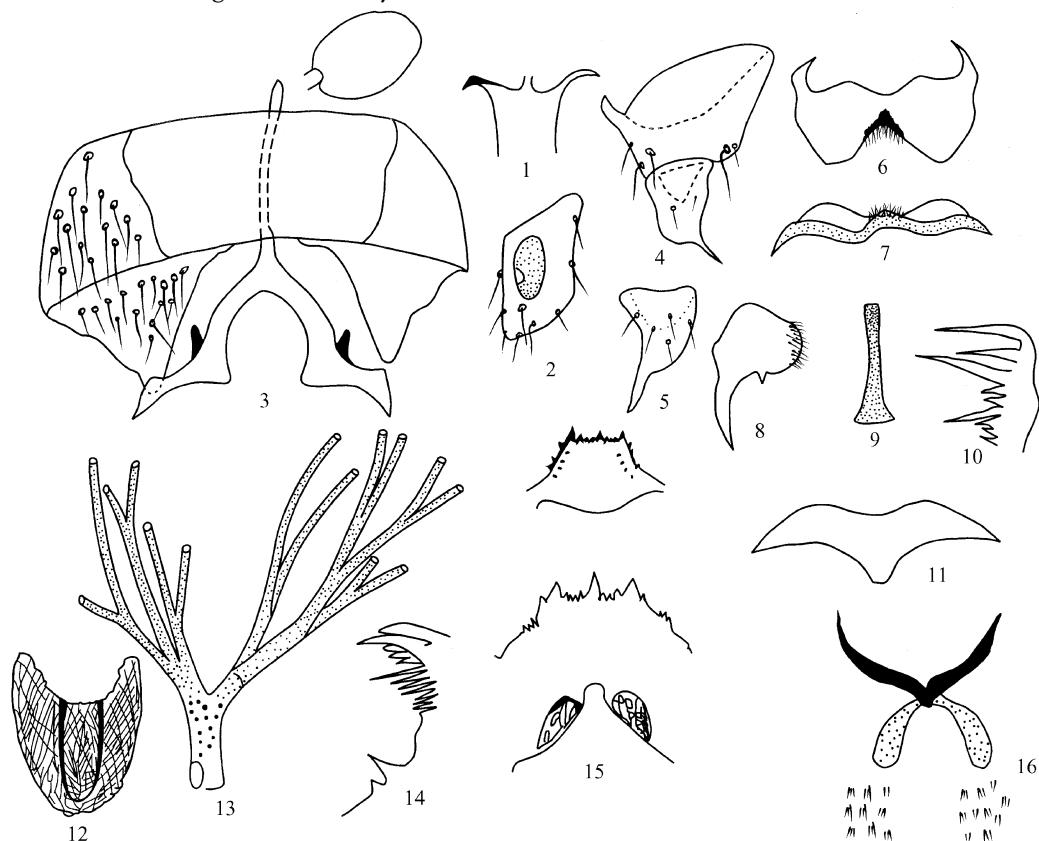
**Abdomen.** Nearly as in female. **Genitalia.** Coxite subconical, longer than wide; style small, about 0.7 length of coxite, tapering distally which is abruptly narrowed on apical third and with a stout apical spine. Ventral plate lamellate, subrectangular in shape, with a distal median margin deep concave and proximal margin weakly convex, plate body much shorter than wide, setose medially; arms short well sclerotized, divergent, then somewhat convergent apically. Parameres each with 4 strongly parameral teeth. Median sclerite rod in shape, gradually widened towards tip. Dorsal plate formed, double wing-shaped.

**Pupa.** Body length about 5.0 mm.

**Head and Thorax.** Integument densely covered

with tubercles. Head trichomes 3 pairs, all simple and short, thoracic trichomes 6 pairs, simple and long. Gill organ. With 14 filaments approximately 3/5 length of pupal body, arranged in groups of 6+8 from dorsal to ventral, all filaments with numerous conical projection.

**Abdomen.** Targa 1 and 2 tuberculate; turgum 2 with 1 long seta and 5 short slender setae on each side; terga 3 and 4 each with 4 hooked spines on each side; tergum 9 with a pair well developed cone-like terminal hooks. Sterna 4-8 each with comb-like groups of very minute spines; sternum 5 with a pair of bifid hooks submedially situated close together on each side; sterna 6 and 7 each with a pair of inner bifid and outer simple hooks widely spaced on each side. Cocoon. Wall pocket-shaped, tightly, extending ventrolaterally, without a definite anterior margin and anterodorsal projection.



Figs 1-16. *Simulium (Montisimulum) jiajinshanense* sp. nov. 1. Female cibarium. 2. Female sensory vesicle. 3. Female genitalia. 4. Coxite and style of male. 5. Style in lateral view. 6. Ventral plate. 7. Ventral plate in posterior view. 8. Ventral plate in lateral view. 9. Median sclerite. 10. Parameral organ. 11. Dorsal plate. 12. Cocoon in dorsal view. 13. Filaments. 14. Larval mandible. 15. Larval head capsules in ventral view. 16. Larval anal sclerite.

**Mature larva.** Body length about 7.0 mm. Cephalic apodome with faint head spots. Antenna composed of 4 segments in proportion of 7.8:7.2:6.8:0.3, with 2 secondary annulations. Head fan with

28-32 main rays. Mandible with a large and a small mandibular teeth but without supernumerary serration. Hypostomium with 9 sharply pointed teeth apically; median and corner teeth prominent and inter mediate

ones smallest; lateral serration weakly developed apically; 5 or 6 hypostomial setae on each side lying subparallel to lateral margins. Postgenal cleft minute. Thoracic and abdominal integument bare. Rectal gills compound, each of 3 lobes with 12–14 finger-like secondary lobules. Anal sclerite with complete posterior arms which anterior arms unite individually. Ventral papillae well developed.

Materials examined. Holotype ♀, reared from pupa, slide mounted. Jiajinshan, Sichuan Province, China; woody vegetation in a small trickle, ( $31^{\circ}20'N$ ,  $103^{\circ}20'E$ ; alt. 3300 m), 30 July 2004. Leg. ZHANG Chur Lin. Paratype: 3 ♂♂, 20 pupae, 13 larvae, all slide mounted and same data as holotype.

Distribution. Sichuan Province, China.

Remarks. There are 45 species of blackflies belonging to the subgenus *Montisimulum* around the world. Most of them distribute in Palaearctic regions, a few of them distribute in Oriental regions. So far, 13 species of blackflies of the *Montisimulum* which most of them distribute in these areas, such as Tibet and Sichuan, are reported in China.

This new species is characterized by the pupa with 14 filaments, this character was shared by several known species, such as *S. (M.) tibetense* Deng et al., 1994. and *S. (M.) moxiense* Chen et al., 2005 from China, *S. (M.) assadovi* (Djafarav, 1956)

from Azerbaijan, *S. (M.) litshkense* (Rubtsov, 1947) from Armenia, *S. (M.) quattuordecimfiatliatum* (Rubtsov, 1947) from Kazakhstan and *S. (M.) quattuordecimfilum* Rubtsov, 1947 from Tajikistan.

The new species, however, can be readily separated from other related species mentioned above by several combination characters including the shape of cibarium in the female, the structure of female and male genitalia, the simple cocoon and the filaments branching in the pupa, and the several characters of larva.

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## 四川省山蚋亚属一新种记述(双翅目, 蚊科)

张春林 陈汉彬

贵阳医学院 贵阳 550004

**摘要** 继作者于2005年首次发现并记述四川省山蚋亚属二新种之后, 报道四川省山蚋亚属另1新种, *Simulium (Montisimulum) jiajinshanense* sp. nov. (夹金山山蚋)。本新种与报告自中国的 *S. (M.) tibetense* Deng et al., 1993 (西藏山蚋) 和 *S. (M.) moxiense* Chen et al., 2005 (磨西山蚋), 阿塞拜疆的 *S. (M.) assadovi* (Djafarav, 1956), 亚

美尼亚的 *S. (M.) litshkense* (Rubtsov, 1947), 哈萨克斯坦的 *S. (M.) quattuordecimfiatliatum* (Rubtsov, 1947) 和塔吉克斯坦的 *S. (M.) quattuordecimfilum* Rubtsov, 1947 相似, 均具14条呼吸丝, 但新种可依据食窦弓具中突, 两性生殖器的特殊形态, 茧简单和呼吸丝特殊分枝等综合特征和上述近缘种相区别。